Smootharc Advance

MIG 275R & MIG 350R
Service manual

BOC
A Member of The Linde Group

Recommended Safety Precautions

Electrical Shock

- Never touch 'live' electrical parts.
- Always repair or replace worn or damaged parts.
- Disconnect power source before performing any maintenance or service.
- Earth all work materials.
- Never work in moist or damp areas.

Avoid electric shock by:

- Wearing dry insulated boots.
- Wearing dry leather gloves.
- Working on a dry insulated floor where possible.

Warranty Information

Terms of Warranty

The Smootharc ADVANCE machine has a limited warranty that covers manufacturing and material defects only. The warranty is affected on the day of purchase and does not cover any freight, packaging and insurance costs. Verbal promises that do not comply with terms of warranty are not binding on warrantor.

Limitations on Warranty

The following conditions are not covered under terms of warranty: loss or damage due to or resulting from natural wear and tear, non-compliance with operating and maintenance instructions, connection to incorrect or faulty voltage supply (including voltage surges outside equipment specs), incorrect gas pressure overloading, transport or storage damage or fire or damage due to natural causes (e.g. lightning or flood). This warranty does not cover direct or indirect expenses, loss, damage of costs including, but not limited to, daily allowances or accommodation and travelling costs.

NOTE
Under the terms of warranty, welding torches and their consumables, feed, drive rollers and feeder guide tubes are not covered. Direct or indirect damage due to a defective product is not covered under the warranty. The warranty is void if changes are made to the product without approval of the manufacturer, or if repairs are carried out using non-approved spare parts. The warranty is void if a non-authorised agent carries out repairs.

Warranty Period

The warranty is valid for 3 years from date of purchase provided the machine is used within the published specification limits.

Warranty Repairs

Your service provider must be informed within the warranty period of any warranty defect. The customer must provide proof of purchase and serial number of the equipment when making a warranty claim. Warranty repairs may only be carried out by approved BOC service providers. Please contact your local BOC Gas & Gear for a directory of BOC approved service providers in your area.

Important Notice

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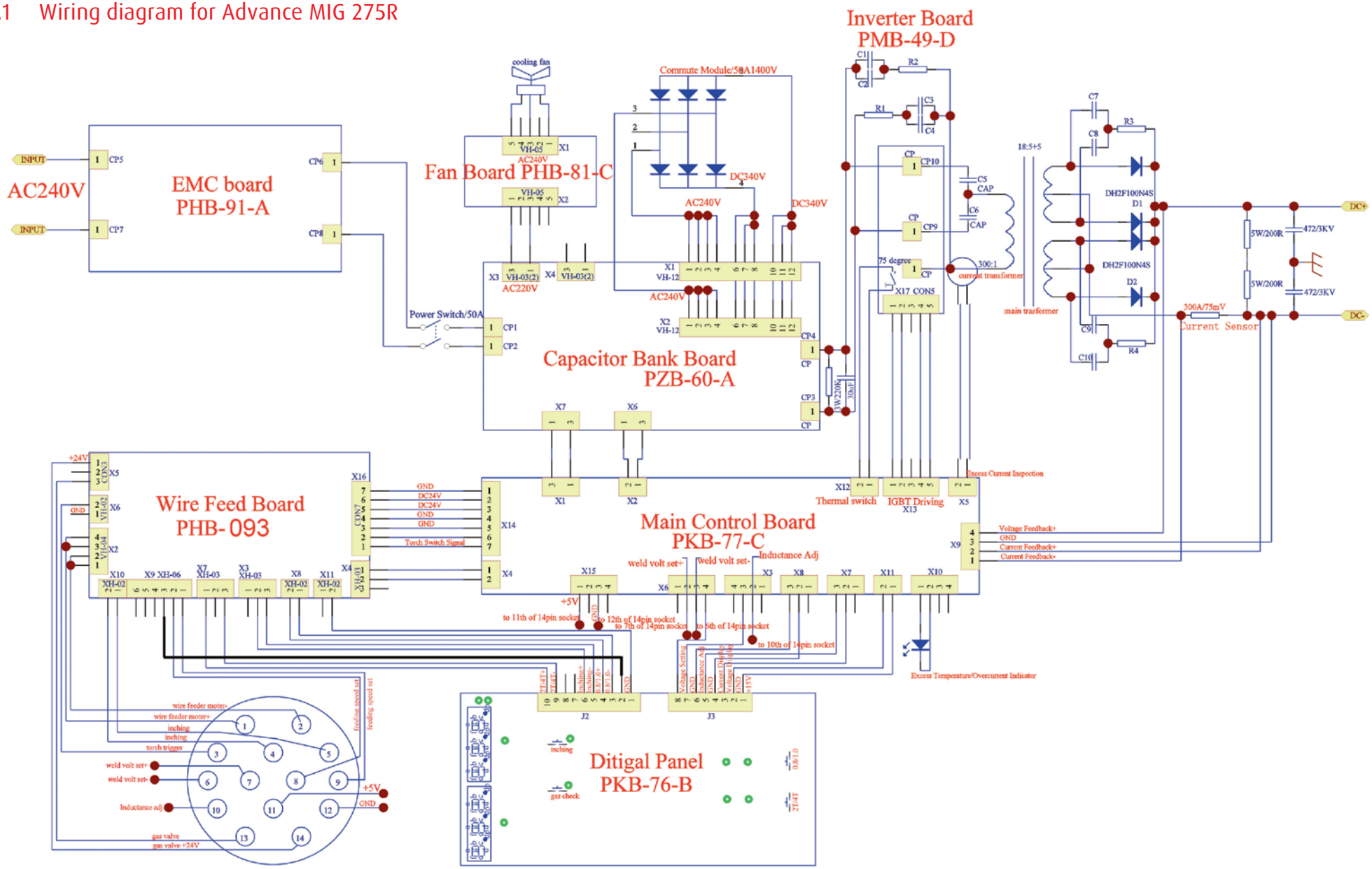
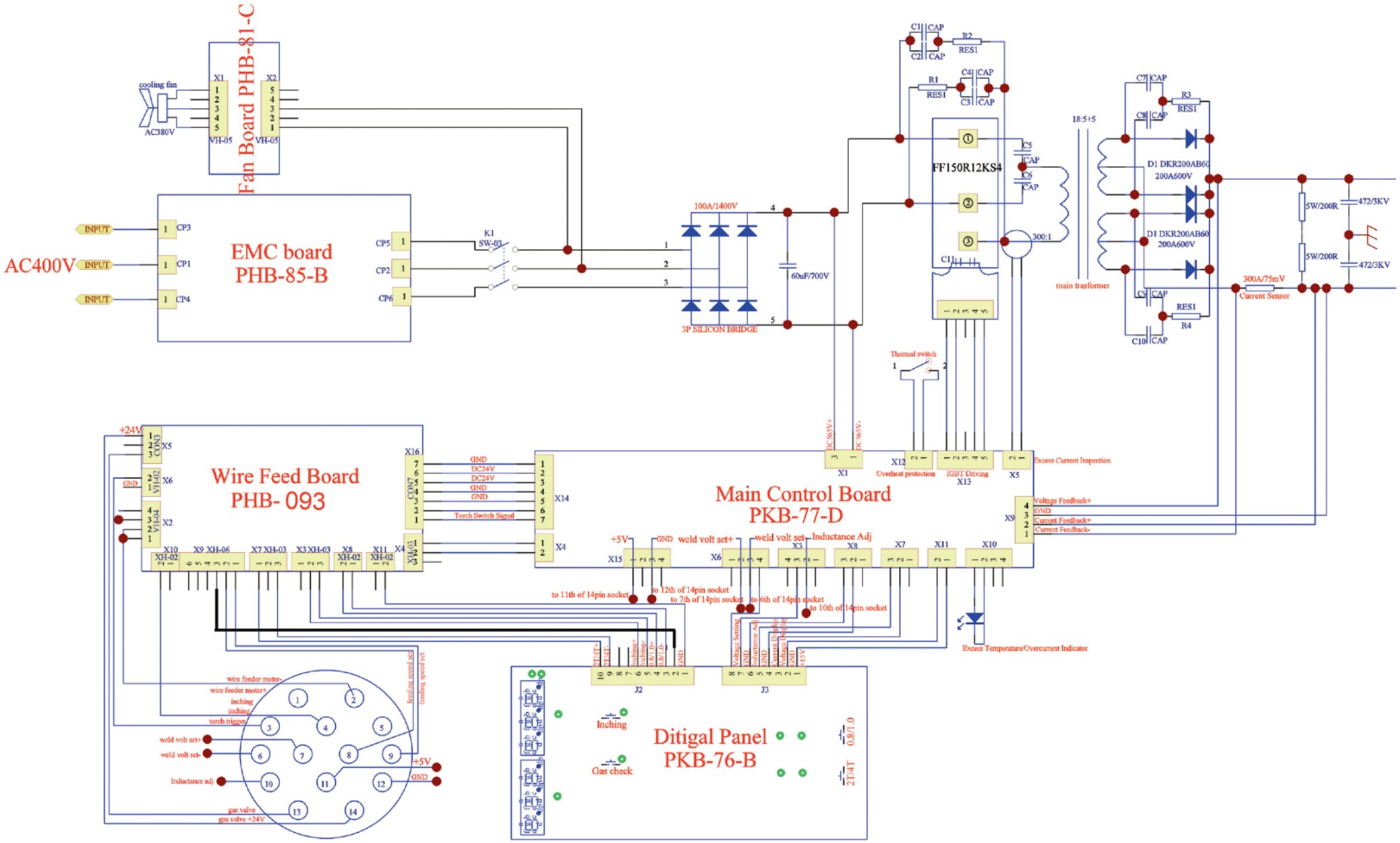
1.0 Fundamental schematic and circuit diagrams

1.1 Wiring diagram for Advance MIG 275R

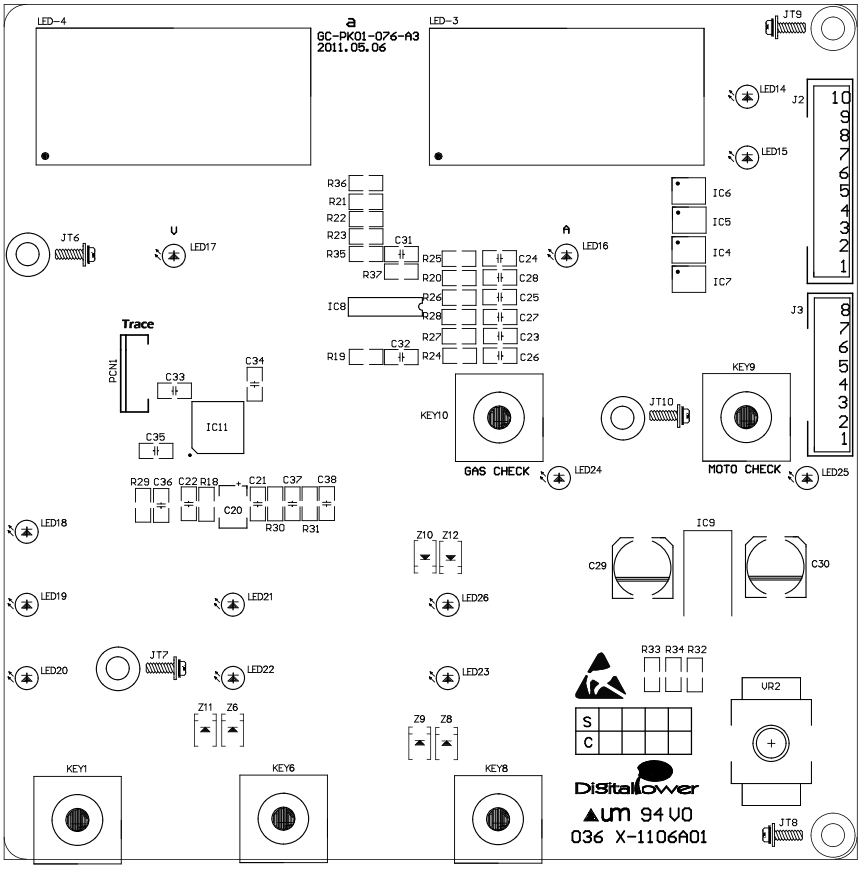


1.2 Wiring diagram for Advance MIG 350R



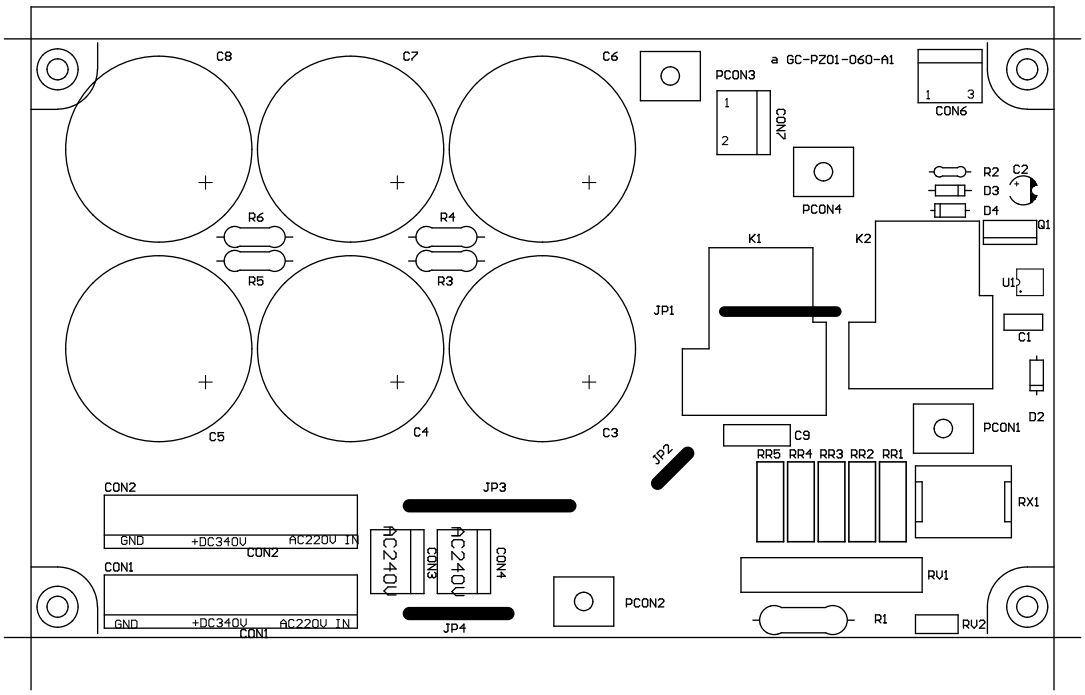
1.3 Advance MIG 275R & MIG 350R boards

1.3.1 Control panel schematic



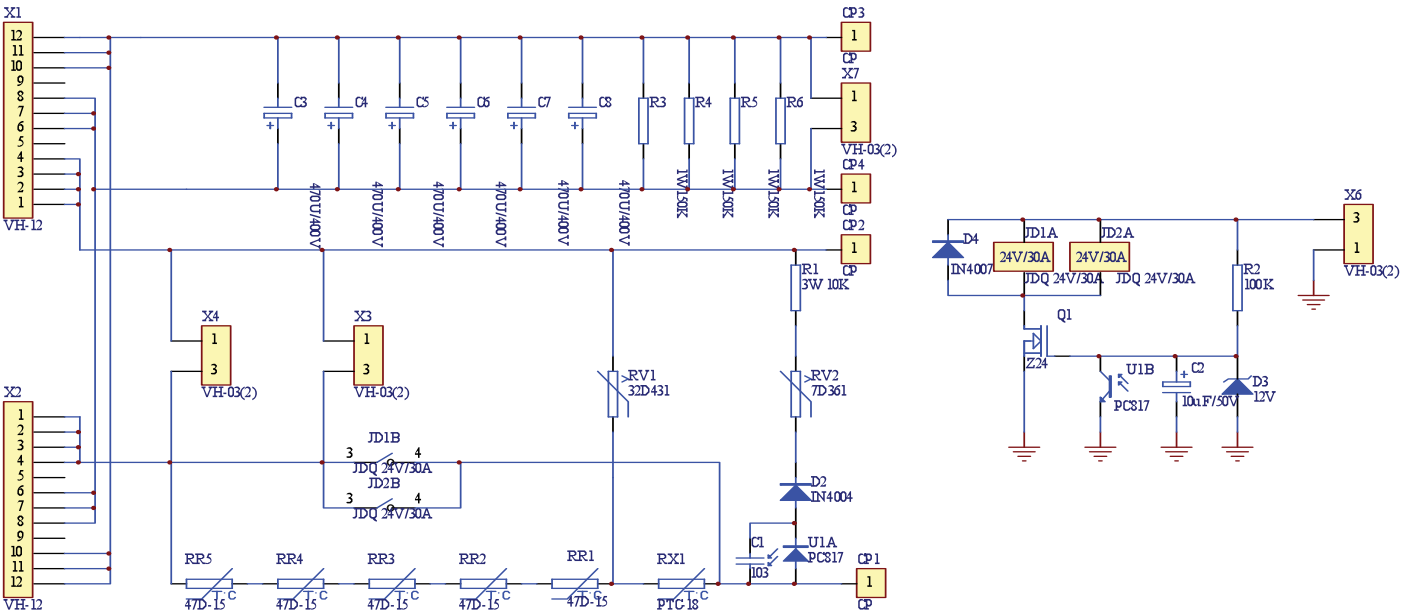
Ser. No.	Pin	Description
J3	1	15V
	2	GND
	3	voltmeter
	4	Ampere meter
	5	GND
	6	Arc characteristic
	7	GND
	8	Volt Set signal
J2	1	GND
	2	Set wire feed speed
	3	Once pin 4 is at high potential, fast wire speed; once at low potential, low wire speed
	4	12V
	5	Once pin 5 is at high potential check gas; once at low potential, do not check gas
	6	12V
	7	NC
	8	NC
	9	Once pin 2 is at high potential, 2T; once at low potential, 4T
	10	12V

1.3.2 Bottom board schematic

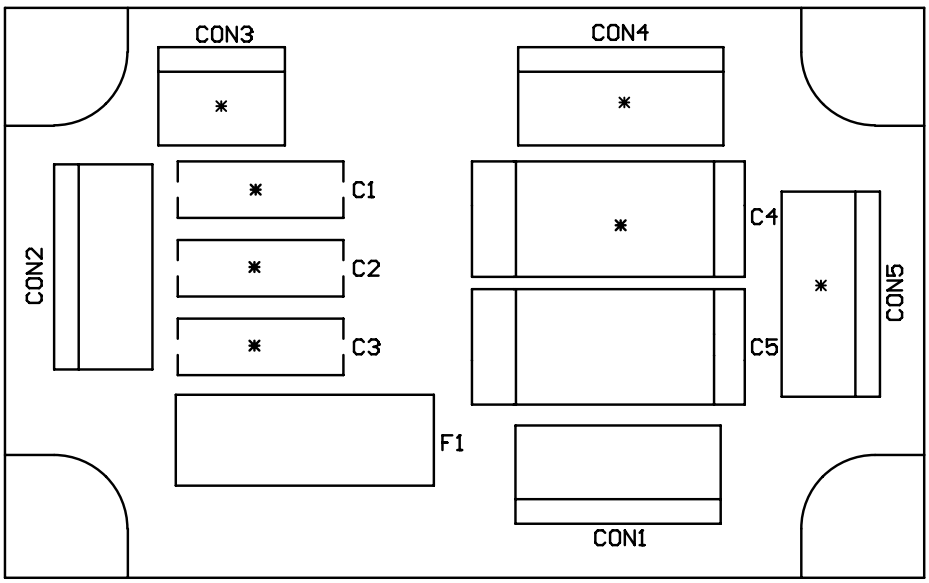


Ser. No.	Pin	Description
CON3		AC240V
CON4		AC240V connect solenoid valve
CON6	1	GND
	3	24V
CON7	1	GND
	2	+DC340V
K1		Solenoid valve relay if the solenoid valve is not pulling in: if 24V relay pulls in solenoid valve damaged; if 24V relay does not pull in Q1 Z24 circuit damage check it.
K2		Slow starting relay
RX1		Field-discharge resistance: if startup frequency is high, field-discharge resistance will break off cool down for a while and re-start.

1.3.3 Bottom board circuit diagram



1.3.4 Fan board schematic

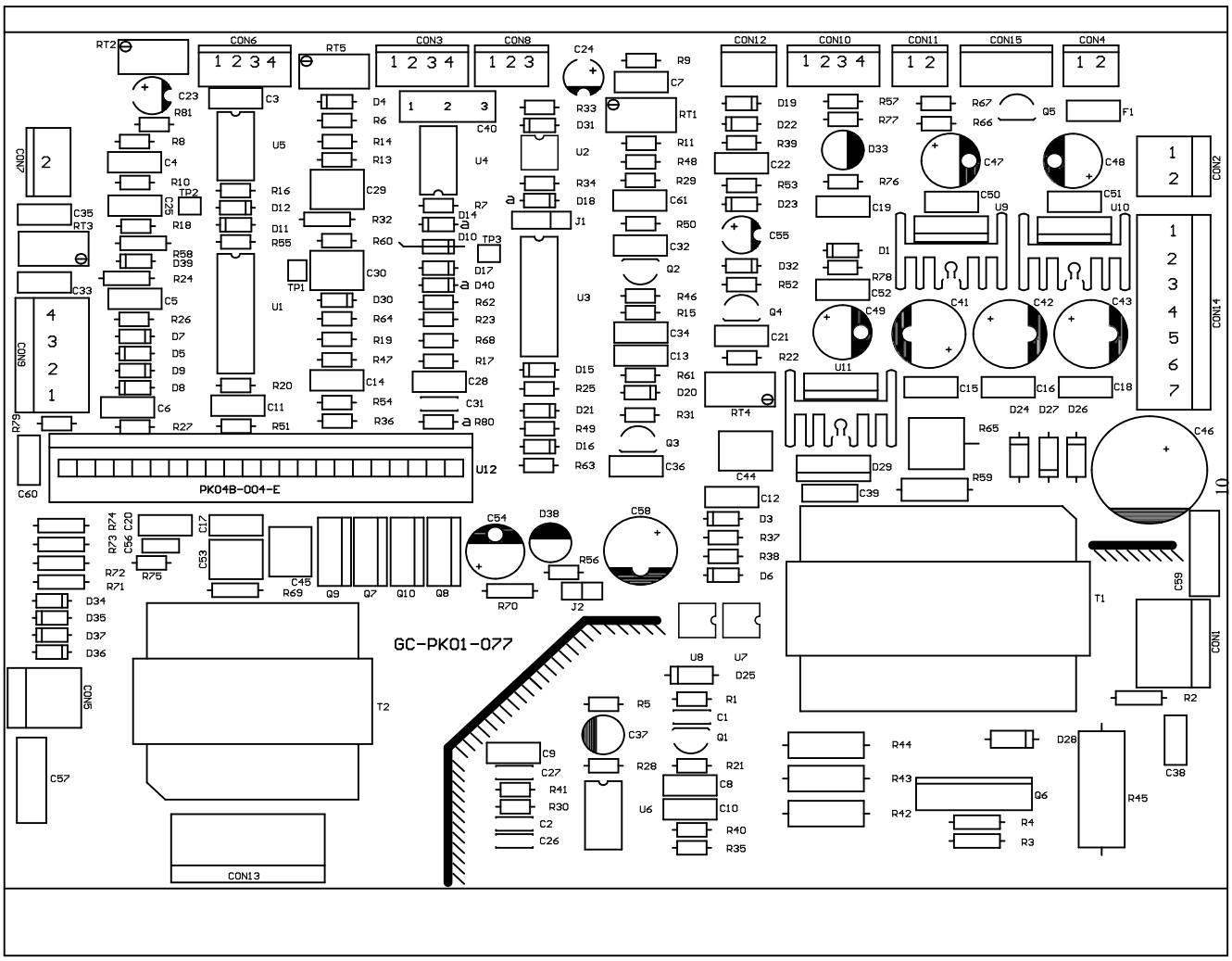


Ser. No.	Description
CON1	Fan, C5 fan startup capacitor
CON2	AC220V input

Notice: MIG350R has common principle

Caption needed

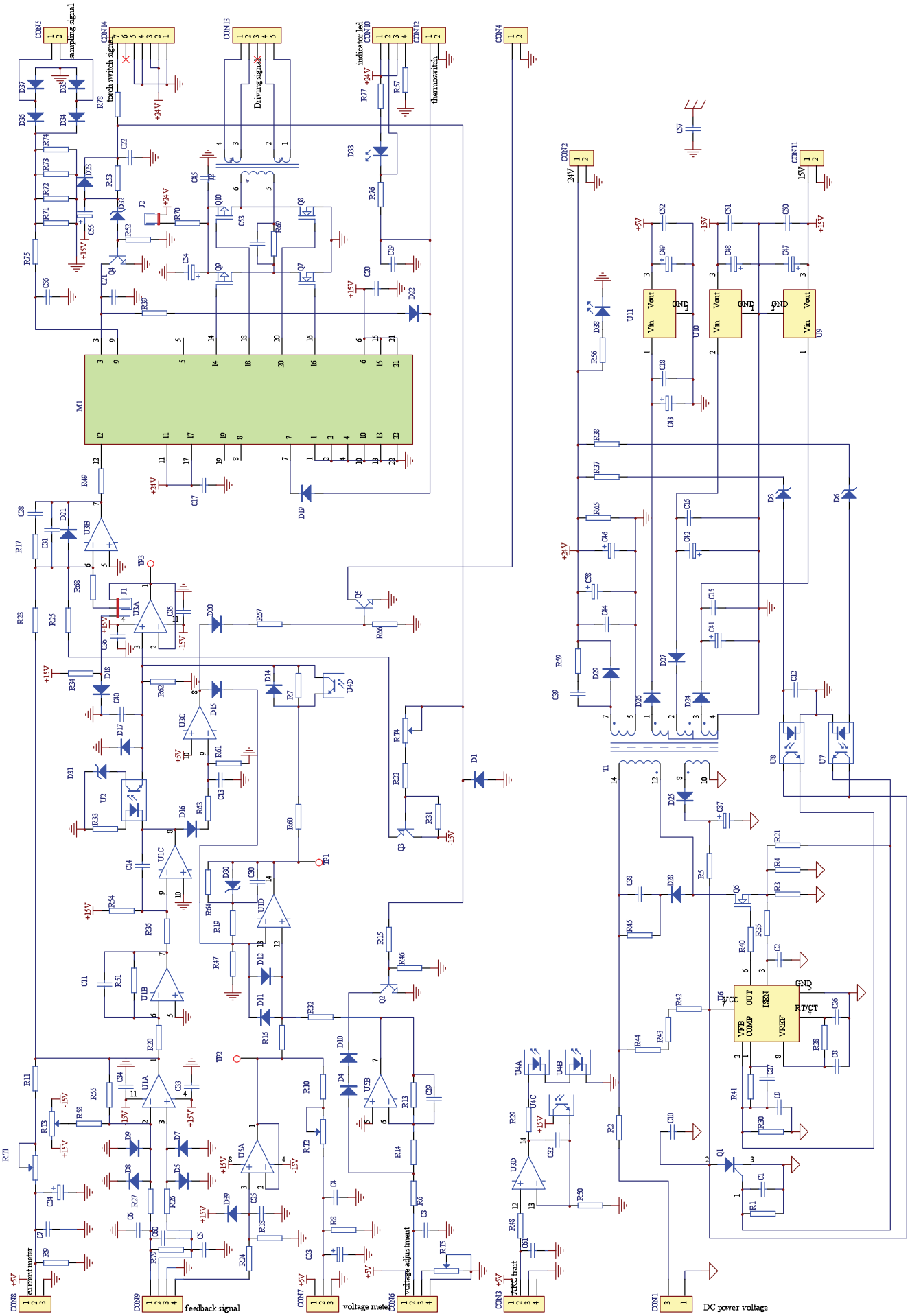
1.3.5 Control board schematic



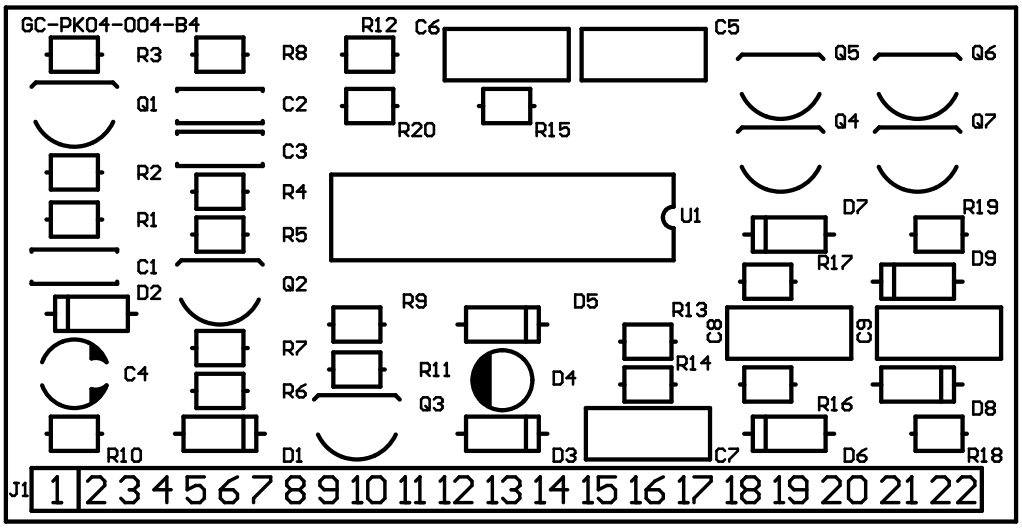
Ser. No.	Pin	Description
CON1		DC auxiliary current MIG275R DC auxiliary current is 310V while MIG350R is 540V if the above DC auxiliary current needs to be repaired particular attention must be paid to the positive and negative pole
CON2	1	24V
	2	GND
CON3	1	5V
	2	Arc characteristic signal
	3	GND
	4	NC
CON4	1	Current detection signal, if pin 1 is at low potential, no output current; if high potential, no output
	2	GND
CON5		Mutual inductor, current sampled signal
CON6	1	5V
	2	Volt Set signal
	3	Lowest Volt Set signal
	4	GND
CON7		CON7 pin 2 voltmeter sampled signal
CON8	1	5V
	2	Ampere sampled signal
	3	GND

Ser. No.	Pin	Description
CON9	1	Current feedback signal
	2	
	3	GND
	4	Voltage feedback signal
CON10	1	24V
	2	Guard lamp
	3	24V
	4	Power light NC
CON11	1	15V
	2	GND
CON12		Current detection signal
CON13		Drive signal
CON14	1	GND
	2	24V
	3	24V
	4	GND
	5	GND
	6	GND pin 5 and pin 6 short circuit
	7	24V seal signal
CON15		NC

1.3.6 Control board circuit diagram

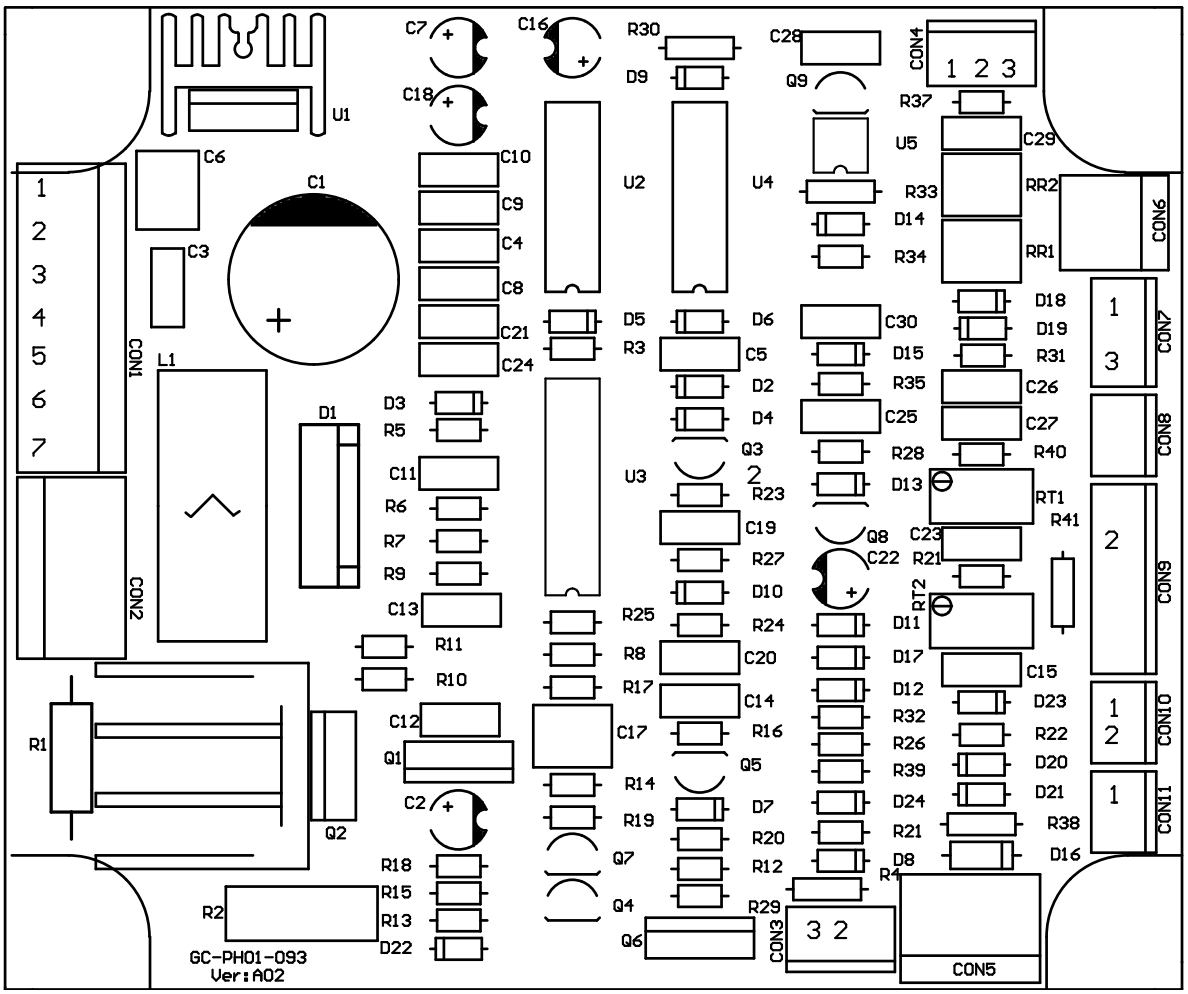


1.3.7 Control module schematic



Ser. No.	Description
1	GND
2	GND
3	Seal signal pin. Seals if low potential, lower 3525 pin 8.
4	GND
5	NC
6	15V
7	Overheating protection signal: if low potential, overheating protection is activated.
8	NC
9	Over current protection: Pin 9 is a mutual inductor current sampled signal. If the potential is higher than the set value, it will close
10	GND
11	24V
12	Set signal
13	GND
14	Drive signal
15	15V
16	Drive signal
17	24V
18	Drive signal
19	NC
20	Drive signal
21	NC
22	GND

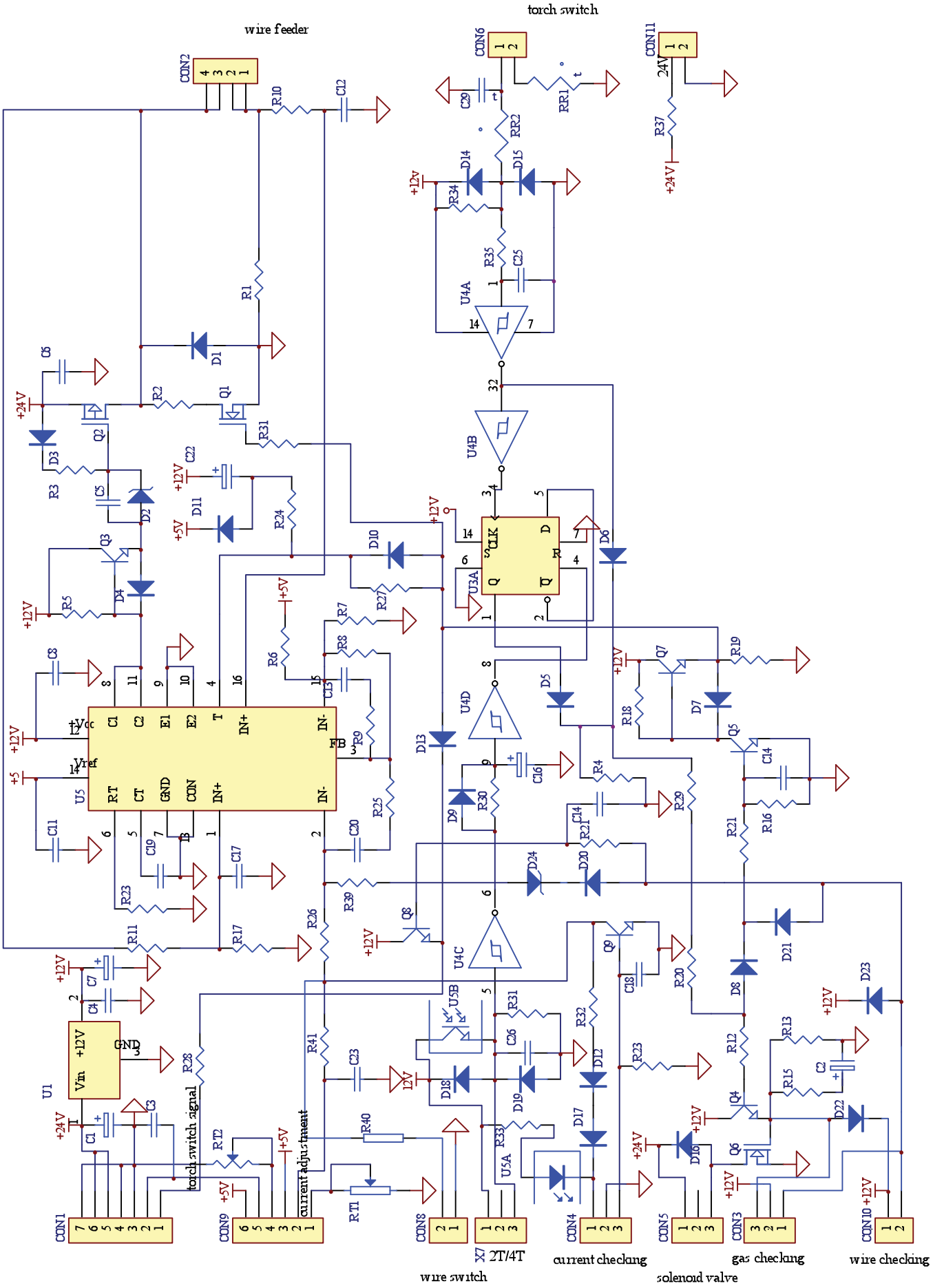
1.3.8 Wire feed board schematic



Ser. No.	Pin	Description
CON1	1	GND
	2	24V
	3	24V
	4	GND
	5	GND
	6	GND pin 5 and pin 6 short circuit
	7	24V seal signal
CON2		Wire feeder
CON3	1	NC
	2	12V
	3	Check gas. If pin 3 potential is higher, Q6 break over, solenoid valve pull in, gas feeds.
CON4	1	Current detection signal. If output end current exists, feeds wire in normally, if no load, no current, pin 1 has low potential, TL494 pin 2 potential will be lowered, wire feed speed becomes slow.
	2	GND
	3	NC

Ser. No.	Pin	Description
CON5		If solenoid valve, gas-check and hand switch is on, solenoid valve should pull in thus allowing gas feed.
CON6		Fan switch signal
CON7	1	12V
	3	2T/4T. If pin 3 potential is high 2T, If low potential, 4T.
CON8		NC (wire diameter option)
CON9	2	Wire feed speed set signal, other pins NC
CON10	1	12V
	2	If pin 2 is at high potential, Q8 breaks over, closes, stable volt D20 reverse break down. TL494 pin 2 high potential, wire feed speed is at maximum
CON11	1	24V.

1.3.9 Wire feed board circuit diagram



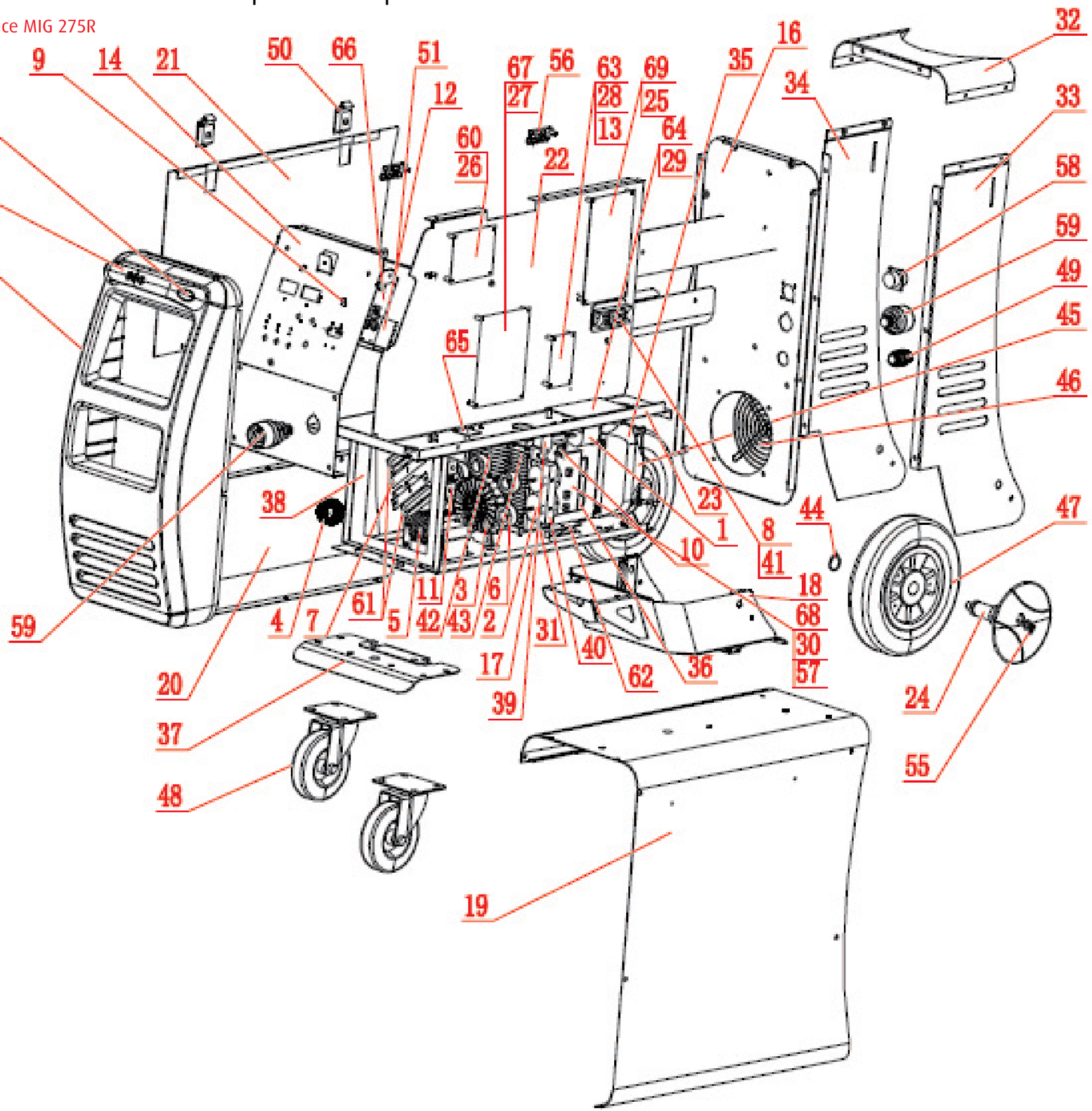
2.0 Troubleshooting and maintenance

Problem	Possible Reasons	Solution
1 Switch on and no response	1 The external power supply is abnormal, power wires may not be properly connected; (Test point 1, test the input voltage on the EMC board and power board input pin) 2 Rectifier silicon bridge damage causes the input to short circuit.	1 Check and confirm whether the input voltage into the machine, no over-voltage or under-voltage condition, make sure the power cord is connected correctly. 2 Test the performance of the rectifier silicon bridge
2 Switch on fan is working, turn on the switch of welding torch, but still no response	1 Torch switch is damaged or the control wire is loose 2 Poor contact of the torch and the power source or wire feeder connections 3 The auxiliary power supply has a circuit failure	1 Check the torch control wire 2 Reconnect the wire feeder 3 Detect if it's 24V with a multimeter, if not, check the control board auxiliary power for any component damage
3 Power light is on, the fan stops after a while, or once the torch switch is pressed, the machine shuts down	1 Bottom board PZ-60-A degaussing resistance damage, the main relay K2, 7D361 pressure-sensitive resistor damage 2 The supply voltage is too high, causing over-voltage protection to activate 3 Continuously switching on and off within a short period of time resulting in the startup resistor overheating. Can't start up. 4 The control board auxiliary power supply is damaged	1 Check and replace the components or bottom board 2 Check whether the voltage exceeds AC 380V or grid voltage is too high 3 Stop for a few minutes, allow the resistor to cool before restart. 4 Check whether the auxiliary power part MOSFET, IC3843, resistors and other components are damaged and if so, replace.
4 Start up and the air switch breaks	1 Power wire or power supply bottom board short circuit. 2 Over-voltage causes damage to the varistor. 3 Damage to the silicon bridge causes short circuit	1 Replace the power wire or repair bottom board. 2 Replace the varistor, re-adjust the input voltage. 3 Check for a short circuit with a multimeter and replace the silicon bridge
5 Start up, no gas feed or valve not working, other functions are normal	1 Gas circuit is blocked. 2 The valve control circuit is damaged	1 PZ-60-A relay K1 pulls in, replace the solenoid valve 2 Inspect and replace if needed 3 If PZ-60-A has 24V, and the relay does not pull in, then check the valve control circuit components, i.e. MOSFET, Z24 and wire circuit
6 Press the torch switch, gas flows, but no voltage indication in the panel (no load), wire feeder is not working	1 Measure the control panel PK01-077-A whether the drive is 24V with a multimeter; 2 Seal wave, without drive waveform 3 No wave	1 If not 24V, then the R70 (1 ohm) resistor is damaged 2 Check whether there is a drive waveform from the 3525 chip, check the circuit in this area; 3 Wire feed board PHB-93 control circuit: Check CON1 pin 7. Check seal-wave control signal. If pin 7 high, transistor Q5 damaged and needs replacing
7 Press the torch switch, gas out, there is a voltage indication in the panel (no load) but the wire feeder is not working	1 Wire feed board wire feed MOSFET and control circuit damaged 2 Wire feeder control wire broken or poor contact	1 Check whether there is a cold joint in wire feed board PHB-93 Q1 check TL494 pin 4 potential; If high, replace TL494 2 Check and replace in needed
8 Press the torch switch, abnormal indication light on, no output	1 The 2nd rectifier module is damaged 2 The IGBT or drive circuit is damaged	1 Check the performance of rectifier module and replace 2 Check the performance of IGBT module or LED light in the IGBT board, resistors, tantalum capacitors, single tube IGBT and the diode. Replace board
9 Abnormally high welding current or abnormal indicator light while welding	1 Machine is overheating and causes overheating protection to activate 2 IGBT absorption board failure	1 Check whether the fan is damage and causes overheating 2 Check IGBT absorption cement resistors, and capacitors. If damaged, replace.

Problem	Possible Reasons	Solution
10 Porosity in the weld	1 Solenoid valve does not respond: a Solenoid valve coil broken b Solenoid valve cable broken c Solenoid voltage control circuit damaged 2 Lack of shielding gas a The gas flow rate is too low b The solenoid valve is blocked c Check the connection between the cylinder and torch, also check the inside of the gas tube d If using CO_2, the regulator heater power supply may not have been turned on or is not being used.	1 Check and replace if needed 2 Adjust or replace
11 Welding current unstable and large spatter	1 Output controlling voltage is not stable 2 Voltage and current are not adjusted in right position 3 The potentiometer has been damaged 4 The unstable current is caused by using incorrect size contact tip 5 Wire-feeder has been damaged or wire feed rolls are worn 6 Wire-feeder guide tube is aged 7 The torch has been damaged or is worn 8 Wire stick-out is too long	1 Adjust suitable voltage with current. 2 Adjust again 3 Replace 4 Replace 5 Replace 6 Replace 7 Replace 8 Shorten stick out

3.0 Exploded view and component parts list

3.1 Exploded view of Advance MIG 275R

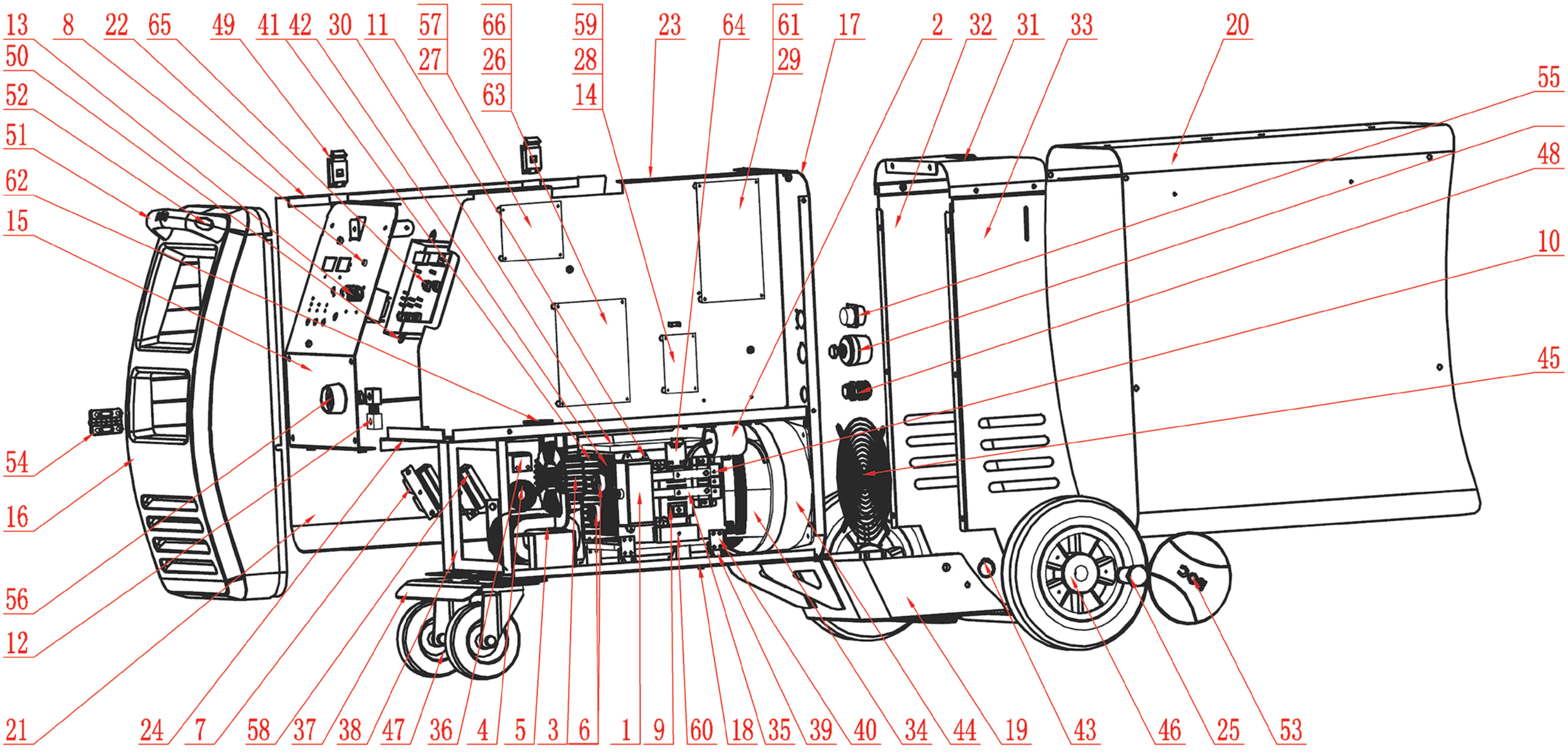


3.2 Component parts list for Advance MIG 275R

Item	Description	Qty	Material Part No.	BOC Part No.
1	Polyester capacitor	1	R-02-010403-02-00	02-010403-02-00
2	Polyester capacitor	2	R-02-010403-04-00	02-010403-04-00
3	Toroidal transformer	1	R-03-010303-23-01	03-010303-23-00
4	Current transformer	1	R-03-010400-05-00	03-010400-05-00
5	Reactor	1	R-03-020200-27-01	03-020200-27-01
6	Magnet ring	4	R-03-030200-04-00	03-030200-04-00
7	Rectifier module	2	R-04-010300-26-00	04-010300-26-00
8	3P rectifier bridge	1	R-04-010403-02-00	04-010403-02-00
9	LED luminous (yellow)	1	R-04-010700-17-01	04-010700-17-01
10	Thermo switch	1	R-06-030000-03-01	06-030000-03-01
11	Diffuser	1	R-06-060000-10-00	06-060000-10-00
12	Circuit breaker	1	R-07-070003-03-00	07-070003-03-00
13	Fuse tube	1	N-09-010000-05-00	09-010000-05-00
14	MIG 275R control output panel	1	R-15-019690-01-A0	15-019690-01-A0
15	BOC host front plastic cover	1	N-15-900600-01-A0	15-900600-01-A0
16	MIG 275R rear panel	1	R-16-037092-01-A2	16-037092-01-A1
17	MIG 200C/275C/275R/350R chassis	1	R-18-171000-01-A1	18-171000-01-A1
18	BOC cylinder tray	1	R-18-205000-01-A0	18-205000-01-A0
19	MIG 275R right side cover	1	R-19-067269-03-A1	19-067269-03-A0
20	MIG 200C left side cover	1	R-19-068222-01-A1	19-068222-01-A0
21	MIG 275R left top side active cover	1	R-19-069269-03-A0	19-069269-03-A0
22	Central board	1	R-21-049200-01-A1	21-049200-01-A0
23	Partition board	1	R-21-051200-01-A0	21-051200-01-A0
24	Rear axle	2	R-22-043001-01-A0	22-043001-01-A0
25	Bottom insulation	1	R-23-010300-56-A0	23-010300-56-A0
26	Control insulation	1	R-23-010400-12-A0	23-010400-12-A0
27	Wire feed insulation	1	R-23-010500-60-A0	23-010500-60-A0
28	3P insulation	1	R-23-010500-67-A0	23-010500-67-A0
29	EMC insulation	1	R-23-010500-72-A0	23-010500-72-A0
30	Thermal buffer aluminum	2	R-23-010800-23-A0	23-010800-23-A0
31	Radiator insulation	2	R-23-010800-26-A1	23-010800-26-A0
32	Cylinder top plate	1	R-23-020103-02-A0	23-020103-02-A0
33	Cylinder left plate	1	R-23-020303-03-A0	23-020303-03-A0
34	Cylinder right plate	1	R-23-020403-03-A0	23-020403-03-A0
35	Fan cover	2	N-23-020602-05-A0	23-020602-05-A0
36	Spring	2	R-23-040000-58-A0	23-040000-58-A0
37	Front roll mounting	1	R-25-020102-51-A0	25-020102-51-A0
38	Supporting frame	1	R-25-020102-52-A0	25-020102-52-A0
39	Radiator stand	4	N-25-020200-13-A0	25-020200-13-A0
40	Capacitor stand	2	N-25-020200-14-A0	25-020200-14-A0
41	Radiator board	1	R-26-010270-01-A0	26-010270-01-A0
42	Radiator/heatsink	1	R-26-020531-01-A1	26-020531-01-A0
43	Radiator/heatsink	1	R-26-020532-01-A6	26-020532-01-A2
44	Circlip for Shaft	2	R-36-810253-01-00	36-810253-01-00
45	Fan	1	R-37-120211-03-00	37-120211-03-00
46	Fan guard	1	R-37-130210-01-00	37-130210-01-00
47	Wheel rear	2	R-37-160220-11-02	37-160220-11-02
48	Universal wheel front	2	R-37-160320-10-00	37-160320-10-00
49	Self-locking buckle	1	R-37-190400-08-00	37-190400-08-00
50	Push lock	2	N-37-190401-01-00	N-37-190401-01-00 / 37-190401-01-00
51	Protection box	1	R-37-190500-11-00	37-190500-11-00
52	Handle	1	N-37-241200-10-00	37-241200-10-00
53	–	–	–	–
54	Handle screw cover	2	N-37-251900-02-00	37-251900-02-00
55	Wheel cover	2	N-37-252000-01-A1	37-252000-01-A0

Item	Description	Qty	Material Part No.	BOC Part No.
56	Hinge	2	R-37-290000-01-00	37-290000-01-00
57	Tubular column	4	R-38-503070-11-00	38-503070-11-00
58	14-pin socket	1	R-40-141010-04-00	R-40-141010-04-00
59	35mm female socket	2	R-40-160810-01-00	R-40-160810-01-00 / 40-160810-01-00
60	Wire feed board	1	R-51-PH01-093-B	PH-01-093-A1
61	Absorption board (1)	2	R-51-PH02-033-B	51-PH-33-B-RL
62	Absorption board (2)	1	R-51-PH02-077-C-RL	51-PH-77-C-RL
63	3P board	1	R-51-PH01-081-C-RL	51-PH-81-C-RL
64	EMC board	1	R-51-PH02-091-A-RL	51-PH-91-A-RL
65	Absorption board (3)	1	R-51-PH02-092-C-RL	51-PH-92-B-RL
66	Control board digital	1	R-51-PK01-076-B-RL	51-PK-76-D-RL
67	Control board (main)	1	R-51-PK01-077-E-RL	51-PK-77-E-RL
68	IGBT inverter PCB (top)	1	R-51-PM01-049-D1	51-PM-49-D1-RL
69	Capacitor PCB (bottom)	1	R-51-PZ01-060-A-RL	51-PZ-60-A-RL
70	Interconnecting cable 1m	1	R-52-3501-00-A0	R-52-3501-00-A0
71	Interconnecting cable 10m	1	R-52-3510-00-A0	R-52-3510-00-A0

3.3 Exploded view of Advance MIG 350R



3.4 Component parts list for Advance MIG 350R

Item	Description	Qty	Material Part No.	BOC Part No.
1	Polyester capacitor	1	R-02-010400-14-00	02-010400-14-00
2	Polyester capacitor	1	R-02-010403-01-00	02-010403-01-00
3	Toroidal transformer	1	R-03-010303-24-01	03-010303-24-00
4	Current transformer	1	R-03-010400-05-00	03-010400-05-00
5	Reactor	1	R-03-020200-17-01	03-020200-17-01
6	Magnet ring	5	R-03-030200-04-00	03-030200-04-00
7	Rectifier module	2	R-04-010300-22-00	04-010300-22-00
8	LED luminous (yellow)	1	R-04-010700-17-01	04-010700-17-01
9	IGBT	1	R-04-050100-02-00	04-050100-02-00
10	3P rectifier bridge	1	04-QS-06100A1400V	04-QS-06100A1400V
11	Thermo switch	1	R-06-030000-06-01	06-030000-06-01
12	Diffuser	1	R-06-060000-11-00	06-060000-11-00
13	Circuit breaker	1	R-07-070003-04-00	07-070003-04-00
14	Fuse tube	1	N-09-010000-05-00	09-010000-05-00
15	MIG350R control output panel	1	R-15-019790-01-A0	15-019790-01-A0
16	BOC host front plastic cover	1	N-15-900600-01-A0	15-900600-01-A0
17	MIG350R rear panel	1	R-16-038092-01-A2	16-038092-01-A0
18	MIG200C/275C/275R/350R chassis	1	R-18-171000-01-A1	18-171000-01-A1
19	BOC cylinder tray	1	R-18-205000-01-A0	18-205000-01-A0
20	MIG 350R right side cover	1	R-19-067269-04-A1	19-067269-04-A0
21	MIG200C left side cover	1	R-19-068222-01-A1	19-068222-01-A0
22	MIG 350R left top side active cover	1	R-19-069269-04-A0	19-069269-04-A0
23	Central board	1	R-21-049200-01-A1	21-049200-01-A0
24	Partition board	1	R-21-051200-01-A0	21-051200-01-A0
25	Rear axle	2	R-22-043001-01-A0	22-043001-01-A0
26	Control insulation	1	R-23-010400-12-A0	23-010400-12-A0
27	Wire feed insulation	1	R-23-010500-60-A0	23-010500-60-A0
28	3P insulation	1	R-23-010500-67-A0	23-010500-67-A0
29	EMC insulation	1	R-23-010800-18-A1	23-010800-18-A1
30	Radiator insulation	2	R-23-010800-27-A0	23-010800-27-A0
31	Cylinder top plate	1	R-23-020103-02-A0	23-020103-02-A0
32	Cylinder left plate	1	R-23-020303-03-A0	23-020303-03-A0
33	Cylinder right plate	1	R-23-020403-03-A0	23-020403-03-A0
34	Fan cover	2	N-23-020602-07-A0	23-020602-07-A0
35	Rectifier bridge and IGBT connector	2	R-24-021300-05-A0	24-021300-05-A0
36	Positive and radiator connector	1	R-24-021800-06-A0	24-021800-06-A0
37	Front wheel mounting	1	R-25-020102-51-A0	25-020102-51-A0
38	Partition board stand	1	R-25-020102-52-A0	25-020102-52-A0
39	Radiator stand	4	R-25-020200-10-A1	25-020200-10-A0
40	Radiator frame	4	R-25-020200-30-A0	25-020200-30-A0
41	Radiator/heatsink	1	R-26-020551-01-A0	26-020551-01-A0
42	Radiator/heatsink	1	R-26-020552-01-A0	26-020552-01-A0
43	Circlip for shaft	2	R-36-810253-01-00	36-810253-01-00
44	Fan	1	N-37-120522-02-00	37-120522-02-00
45	Fan guard	1	R-37-130310-01-00	37-130310-01-00
46	Wheel rear	2	R-37-160220-11-02	37-160220-11-00
47	Universal wheel front	2	R-37-160320-10-00	37-160320-10-00
48	Self-locking buckle	1	R-37-190400-08-00	37-190400-08-00
49	Push-lock	2	N-37-190401-01-00	N-37-190401-01-00 / 37-190401-01-00
50	Protection box	1	R-37-190500-11-00	37-190500-11-00
51	Handle	1	N-37-241200-10-00	37-241200-10-00
52	Handle screw cover	2	N-37-251900-02-00	37-251900-02-00
53	Wheel cover	2	N-37-252000-01-A1	37-252000-01-A0
54	Hinge	2	R-37-290000-01-00	37-290000-01-00
55	14 pin socket	1	R-40-141010-04-00	R-40-141010-04-00

Item	Description	Qty	Material Part No.	BOC Part No.
56	35mm female socket	2	R-40-160810-01-00	R-40-160810-01-00
57	Wire feed board	1	R-51-PH01-093-B	PH-01-093-A1
58	Absorption board (1)	2	R-51-PH02-033-B	51-PH-33-B-RL
59	3P board	1	R-51-PH01-081-C-RL	51-PH-81-C-RL
60	IGBT absorption board	1	R-51-PH02-083-A-RL	51-PH-83-A-RL
61	EMC board	1	R-51-PH02-085-B-RL	51-PH-85-B-RL
62	Absorption board (2)	1	R-51-PH02-092-C-RL	51-PH-92-C-RL
63	MIG control module	1	R-51-PK04-004-D-RL	51-PK-04-D-RL
64	IGBT drive module	1	R-51-PK03-015-D-RL	51-PK-15-D-RL
65	Control board	1	R-51-PK01-076-D-RL	51-PK-76-D-RL
66	Control board	1	R-51-PK01-077-D-RL	51-PK-77-D-RL
67	Interconnecting cable 1m	1	R-52-3501-00-A0	R-52-3501-00-A0
68	Interconnecting cable 10m	1	R-52-3510-00-A0	R-52-3510-00-A0

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